

1. A stent delivery system for transporting and deploying an expansible stent, said stent delivery system comprising:
- A) delivery means for positioning the stent at a selected position in the patient's body, said delivery means including a sheath normally overlying the stent in its compact transport form and an inner core normally underlying the stent in its compact transport form, and
- B) deployment means for selectively deploying and retracting the stent relative to said sheath, said deployment means including a ring attached to and extending from said inner core and engaging the stent in its compact condition.
2. A stent delivery system as recited in claim 1 wherein the outer diameter of said ring is greater than the minimum inner diameter of the stent in its compacted form.
3. A stent delivery system as recited in claim 2 wherein said ring engages the stent proximate a proximal end of the stent in its compacted delivery state.
4. A stent delivery system as recited in 3 wherein said delivery means further includes a handle disposed at a

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5 proximal end of said sheath and said inner core, said  
handle having a first actuator means for proximally  
retracting said sheath relative to said inner core and  
second actuator means for distally displacing said inner  
core relative to said sheath, such that selective  
manipulation of said first and second actuator means  
10 enables selective deployment of the stent in an expanded  
form outside of said sheath and retraction of the stent  
within said sheath from a partially deployed state.

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- 5 5. A stent delivery system as recited in claim 1 wherein said  
delivery system is adapted for use in the working channel  
of an endoscopic device of the type having a viewing  
channel, said catheter including visible indicia proximate  
its distal end visible through the viewing channel of the  
endoscopic device indicating the extent of deployment of  
the stent.

- 5 6. A stent delivery system as recited in claim 5 wherein said  
delivery means further includes a handle disposed at a  
proximal end of said sheath and said inner core, said  
handle having a first actuator means for proximally  
retracting said sheath relative to said inner core and  
second actuator means for distally displacing said inner  
core relative to said sheath, such that manipulation of

10 said first and second actuator means enables selective deployment of the stent in an expanded form outside of said sheath and retraction of the stent in the compact form within said sheath.

- 0/p 7. A stent delivery system as recited in claim 1 further comprising a second ring axially spaced from said first ring, said first and second rings engaging the stent proximate a proximal end of the stent in its compacted delivery state.

- 5 8. A stent delivery system as recited in claim 7 wherein said delivery means further includes a handle disposed at a proximal end of said sheath and said inner core, said handle having a first actuator means for proximally retracting said sheath relative to said inner core and second actuator means for distally displacing said inner core relative to said sheath, such that manipulation of said first and second actuator means enables selective deployment of the stent in an expanded form outside of  
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10 said sheath and retraction of the stent within said sheath from a partially deployed condition in the compact form.

9. A stent delivery system as recited in claim 8 wherein said delivery system is adapted for use in the working channel

5 of an endoscopic device of the type having a viewing channel, said catheter including visible indicia proximate its distal end visible through the viewing channel of the endoscopic device indicating the extent of deployment of the stent.


10. A stent delivery system as recited in claim 1 further comprising mechanically expansible means underlying said stent for selectively expanding said stent into a deployed condition.


11. A stent delivery system as recited in claim 1 wherein said delivery system is adapted for use in the working channel of an endoscopic device of the type having a viewing channel, said catheter including visible indicia proximate its distal end visible through the viewing channel of the endoscopic device indicating the extent of deployment of the stent.

12. In an elongated, tubular stent delivery system with a distal end including a sheath and a flexible core at a distal end for overlying and underlying, respectively, a stent carried at a distal end of the delivery system in a compact form and for transport within a patient's body for selective deployment in an expanded form within a


10 patient's vessel, and a proximal end including a first  
handle portion connected to the sheath and a second handle  
portion connected to the core to enable relative axial  
displacement of the sheath and the core, the improvement  
comprising a thin ring attached to and extending from the  
core to engage a stent disposed in a compact form within  
said sheath such that upon the displacement of the sheath  
relative to the core the stent moves with said ring  
relative to the sheath.

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13. A tubular stent delivery system as recited in claim 12  
wherein said ring has an outer diameter  $D_r$ , such that  
 $D_r > ID_{min}$ , the minimum inner diameter of portions of the  
stent in its compacted form.
14. A tubular stent delivery system as recited in claim 13  
wherein said ring engages the stent proximate a proximal  
end of the stent in its compacted delivery state.
15. A tubular stent delivery system as recited in claim 14  
wherein said stent has a portion with an inner diameter  
 $ID_{max}$  disposed between portions of the stent having its  
minimum inner diameter where  $ID_{min} < D_r < ID_{max}$  and said  
ring is disposed intermediate the minimum inner diameter  
portions.

5  16. A tubular stent delivery system as recited in claim 15 wherein said delivery system is adapted for use in the working channel of an endoscopic device of the type having a viewing channel and the distal end of the tubular stent having indicia proximate the distal end of the core, said indicia being of the type visible through the viewing channel of an endoscopic device and indicating the extent of deployment of the stent.

5 17. A tubular stent delivery system as recited in claim 12 further comprising a second ring secured to the core proximate to and axially spaced from said first ring,  wherein said first and second rings are proximally spaced from a distal end of the stent in its compacted delivery state.

18. A tubular stent delivery system as recited in claim 17 further comprising means for mechanically urging the expansion of the stent from its compact form.

 19. A tubular stent delivery system as recited in 12 further comprising means for mechanically urging the expansion of the stent from its compact form.

20. A method for delivering and selectively deploying a stent comprising the steps of:

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- A) inserting within the body of a patient an axially extending catheter, the catheter having an exterior sheath, with a stent in a compact form proximate a distal end of the catheter that underlies the sheath and overlies a ring,
- B) urging the distal end of the catheter through the patients body to position the distal end at a selected location, and
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- C) selectively displacing the ring relative to the sheath to urge the displacement of said stent relative to the sheath to enable selective extension and retraction of the stent relative to a distal end of the sheath.
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21. A method for delivering and selectively deploying a stent as recited in claim 20 further comprising inflating a balloon underlying the stent in its compact form and overlying the ring to mechanically urge the expansion of the stent.

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22. A method for delivering and selectively deploying a stent as recited in claim 20 wherein the stent is self-expansive and said step of displacing the stent distally of the

5 sheath enables deployment of the stent engaging step  
includes engaging the inner surface of the stent between  
portions of the stent having a minimum inner diameter.

23. A method for delivering and selectively deploying a stent  
as recited in claim 20 further comprising viewing indicia  
on the catheter during said displacing step to determine  
whether the stent is retractable said engaging step  
further includes engaging the inner surface with a second  
closely spaced annular ring.